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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,122	07/15/2003	Laurent Filipozzi	4717-8100	1944

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EXAMINER	
RACHUBA, MAURINA T	
ART UNIT	**PAPER NUMBER**
3723	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/621,122	FILIPOZZI ET AL.	
	Examiner	Art Unit	
	M Rachuba	3723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Applicant's amendment has overcome the rejection under 35 USC 112.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 7, and 16 are finally rejected under 35 U.S.C. 102(b) as being clearly anticipated by Krishna et al, US005571373A. '373, column 5, lines 18-57, discloses polishing a silicon wafer surface with a polishing solution that has a neutral or basic pH, includes aqueous ammonia (nitrogen-containing base) and further includes dispersed solid particles for mechanically abrading the wafer surface and a chemical agent for chemically attacking the wafer surface, with the polishing conducted to obtain planarization of the wafer surface; and controllably stopping the chemical attack of the wafer surface by progressively introducing a rinsing solution that contains an acidic component onto the wafer surface so that the progressive introduction of the rinsing solution reduces the pH of the polishing solution to prevent chemical attack of the wafer surface beyond a desired planarization. The polishing solution has a basic pH and wherein the stopping of the chemical attack occurs at the same location as the polishing. Further '373 discloses cleaning from the wafer surface residues resulting from the polishing. The cleaning step includes applying a cleaning solution comprising

water to the wafer surface to remove residues. The cleaning solution changes the pH of the polishing solution on the surface of the wafer to a neutral pH. The polishing includes applying a textured material to the wafer surface during polishing.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 8-10 and 18 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna et al, US005571373A. '373 discloses that the slurry comprises nitrogen-containing base (aqueous ammonia) but does not disclose the range of pH of the alkaline slurry or acidic rinsing solution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided '373 with a slurry solution and a rinsing solution in concentrations to provide

the pH as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Here, as '373 discloses the general conditions of the slurry (alkaline) and rinse (acidic), one of ordinary skill would understand that adjusting the concentrations would adjust the pH of each solution, and the pH level desired would depend on the material being polished, and the desired polishing time compared to the desired wafer surface quality. Regarding the further treatment, the examiner takes Official notice that polished and cleaned semiconductor wafers are known to be further treated by forming an integrated circuit on the wafer and that one of ordinary skill would consider this an obvious further treatment of a wafer surface, to provide something useful other than a polished disc.

7. Claims 6, 14, 15 and 18 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna et al, US005571373A in view of Hall et al, US006638145B2. '373 does not disclose drying the wafer, or that rinsing occurs at a location different than that used for polishing ('373 applies the acid quench and cleaning solutions at the position of the wafer on the polishing tool); that the cleaning and rinsing solutions each include deionized water or further treating the wafer to form an integrated circuit. '145, figure 4, teaches it is old and well known to dry a wafer prior to subsequent processing. It would have been obvious to one of ordinary skill to have provided '373 with the drying step taught as prior art by '145, figure 4, to prevent any remaining fluid from contaminating further processing. '145 also teaches that the rinsing solution is provided at a location apart from where the wafer contacts the polishing tool, figure 5 and column

4, lines 24-35. It would have been obvious to have provided '373 with a different rinsing position as taught by '145, to further dilute the slurry with the rinsing solution, allowing the pH to be slowly adjusted. Further, '145 teaches that the rinsing and cleaning solutions contain deionized water. It would have been obvious to one of ordinary skill to have provided '373 with deionized water instead of water, as taught by '145, to inherently prevent contamination of the system from impurities in untreated water.

8. Claims 11-13 and 19 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna et al, US005571373A in view of Nagoshi et al, 5,958,298. '373 does not teach including a surfactant to the rinsing solution, the surfactant being an aqueous solution containing polyoxyalkylene alkyl ether at a critical micelle concentration of about 0.1% or less, the surfactant being hydrophobic, hydrophilic or a combination. '298, column 4, lines 43-57, teaches including a surfactant to a rinsing solution for cleaning electronic components, the surfactant being an aqueous solution containing polyoxyalkylene alkyl ether at a critical micelle concentration of about 0.1% or less. It would have been obvious to one of ordinary skill to have provided '373 with a rinsing solution that includes polyoxyalkylene alkyl ether at a critical micelle concentration of about 0.1% or less, as taught by '298, to prevent the rinsing solution from pooling on the surface of the wafer, see column 2, lines 5-19.

9. Claims 17 and 20 finally rejected under 35 U.S.C. 103(a) as being unpatentable over Krishna et al, US005571373A in view of Jeong US005961377A. '373 does not disclose that the rinsing and cleaning are conducted by a separate rinsing/cleaning plate. '377 teaches a method of polishing then cleaning the wafer using a separate

plate (platen) which inherently has a texture (all surfaces have a texture), see figure 1, prior art. It would have been obvious to one of ordinary skill to have provided '373 with the separate cleaning plate as taught by '377, to aid in removing particles from the wafer surface.

Response to Arguments

10. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection. Applicant's amendment to independent claim 1 overcame the rejection over '145 under 35 USC 102(e). It is the examiner's position that '373 anticipates the pending claims or makes obvious the pending claims alone or in combination with other teachings as set forth above. It is noted that the previous claims did not limit the rinsing solution to containing an acidic component, only that the solution had an acidic pH.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M Rachuba whose telephone number is **(571) 272-4493.** The examiner can normally be reached on Monday-Thursday from 8:30 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail, can be reached on (571) 272-4485. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Rachuba
Primary Patent Examiner